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(54) Cannulated clamp

(57) The application describes a clamping device, comprising:

(a) a guiding member with a guiding channel therethrough, wherein said guiding channel has an exit port; and
(b) a receiving member operatively connected to said guiding member, wherein said receiving member has a receiving device in alignment with said exit port of said guiding channel so that a needle can be guided out of said exit port of said guiding channel; and into said receiving device of said receiving member.

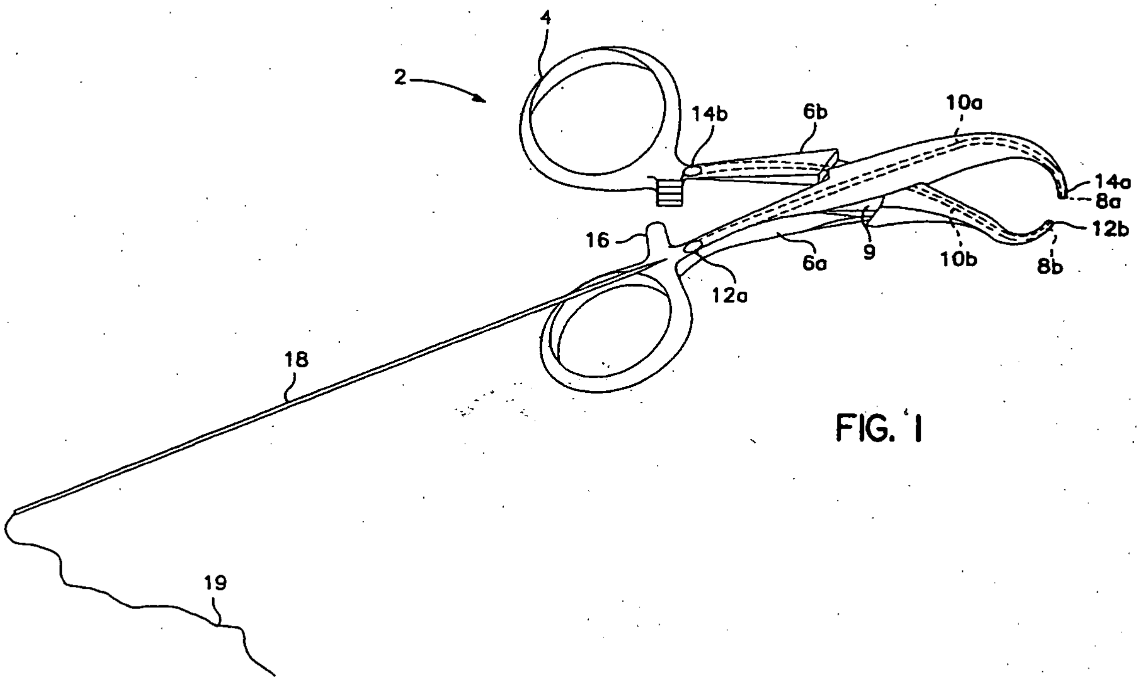

FIG. 1

EP 0 792 621 A1

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of the present invention.

Figure 2 is an orthogonal view of a second embodiment of the present invention.

Figure 3 is an orthogonal view of a third embodiment of the present invention.

Figure 4 is an orthogonal view of a fourth embodiment of the present invention.

Figure 5 is an orthogonal view of a fifth embodiment of the present invention.

Figure 6 is an orthogonal view of a sixth embodiment of the present invention.

Figure 7 is an orthogonal view of a seventh embodiment of the present invention.

Figure 8 is an orthogonal view of a eighth embodiment of the present invention.

The following preferred embodiment as exemplified by the drawings is illustrative of the invention and is not intended to limit the invention as encompassed by the claims of this application. An apparatus and method for clamping and suturing is disclosed herein.

The apparatus, as illustrated generally in Figures 1 through 3, includes a clamping device or forceps (2). The clamping device typically has hand grips (4). The hand grips are used by the surgeon to guide and manipulate the clamping device in order to grasp the sought tissue. Such a clamping device typically has clamping arms (6a) and (6b) which extend from the hand grips and terminate at a clamping surface (8a) and (8b) respectively. One of the clamping arms acts as a guiding member (6a) and one of the clamping arms acts as a receiving member (8b).

Often, as shown in Figures 14, the clamping arms pivot about one another in a scissor-like fashion about a pivot point (9). However, other types of clamping devices may also be used. For example, clamps exists which are known in the art as a Loman clamp. These securely hold tissue during surgical procedures and operate not using a scissor-type motion. Although the embodiments described herein with particularity address those clamps which operate in a scissor-like fashion, the invention is intended to be used in all types of grasping or clamping devices, as shown, for example, in Figure 5.

A channel or cannula (10a) and (10b) is formed within the clamping arms. Each channel has an entrance port (12a) and (12b) and an exit port (14a) and (14b) at opposite ends of each channel. The exit port of one channel is designed and formed to align with the entrance port of the other channel when the clamping surfaces (8a) and (8b) are brought together. The cannulae are formed to have a diameter suitable to pass a flexible needle therethrough. Typically, the diameter of the channel would be approximately 1mm. Of course, depending upon the size of both the needle used and the clamping arms themselves, this dimension may be somewhat greater or smaller than 1 mm.

Optionally, the clamping device may have a securing or locking member (16) which extends from one clamping arm to the other and thereby temporarily retains the clamping surfaces together. This securing member typically is formed as a ratchet and pawl mechanism or in a sloped tooth arrangement. Of course, any device which temporarily locks the arms together in order to keep the clamping surfaces temporarily together may be suitable.

An alternative clamping and needle guiding apparatus is shown in Figure 4. The apparatus includes a clamping device (20). The clamping device generally has hand grips (22a, 22b, 23a, and 23b). The hand grips are used by the surgeon to guide and manipulate the clamping device in order to grasp the sought tissue. The clamping device (20) depicted in

Figure 4 has two sets of clamping arms (24a, 24b, 25a, and 25b) which extend from their respective handgrips and terminate as two sets of clamping surfaces (26a, 26b, 27a, and 27b). One set of clamping surfaces (for example, 26a and 26b) is for grasping and holding one body part and the other set of clamping surfaces (for example, 27a and 27b) are for grasping and holding a second body part.

Although both sets of clamping arms are shown to be pivotable in a scissor-like motion, one or both sets may also be a type of clamp which operate differently.

A channel or cannula (29 and 30) is formed in at least one of the clamping arms of each set of clamps. Each channel has an entrance port (31a and 31b) and an exit port (32a and 32b) at opposite ends of each channel. The exit port of one channel is designed and formed to align with the entrance port of the other channel when the two clamping surfaces are brought together.

Optionally, a securing means may be used to temporarily hold the clamping surface of one clamp with the clamping surface of the other clamp. This securing means may be any of a wide variety of means. Typically, one similar to a thumbscrew may be used, but of course, many forms of securing means are known to one skilled in the art, such as a cam-type locking device.

An alternative embodiment of the present invention is illustrated in Figure 6. One of the clamping arms acts as a guiding member (6a). The other of the clamping arms acts as a receiving member (6b). The receiving member has a receiving channel (10b) formed therein. The channel in the receiving member has an entrance port (12b) at its clamping surface end (8b). This receiving member channel does not have an exit port. Instead, a locking member (34) is positioned on the receiving member for locking a needle within the receiving channel. The locking member shown is positioned in a threaded channel (36). The threaded channel intersects with the receiving channel. A thumbscrew (38) is placed on the exposed end of the locking member. Although this locking member works similar to conventional lock nut design in the threaded channel, other kinds of locking devices may also be employed to secure a needle in the receiving channel.

In an alternate embodiment illustrated in Figure 7, that a needle can be guided out of said exit port of said guiding channel; and into said receiving device of said receiving member.

2. The device of Claim 1, wherein said guiding member further comprises a pushing element adapted for sliding within said guiding channel.

3. The device of Claim 1, wherein said guiding channel has an entrance port distal from said exit port.

4. The device of Claim 1, wherein said receiving device comprises a gripper means.

5. The device of Claim 1, wherein said receiving device comprises a receiving channel with an entrance port.

6. The device of Claim 5, wherein said receiving member further comprises a locking member intersecting said receiving channel for locking a needle therein.

7. A clamping device, comprising:

   (a) a first member with a channel therethrough, wherein said channel has an exit port; and
   (b) a second member operatively connected to said first member, wherein said second member has a channel therethrough, wherein said channel in said second member has an entrance port in alignment with said exit port of said channel of said first member and an exit port, so that a needle can be inserted into said entrance port, guided through said channel of said first member, out of said exit port of said first member, and into said entrance port of said second member.

8. The device of Claim 7, wherein said connection between said first and second members is detachable.

9. The device of Claim 8, further comprising a clamping means for detachably securing said first member with said second member, wherein when said members are secured to one another said exit port of said first member is aligned with said entrance port of said second member.

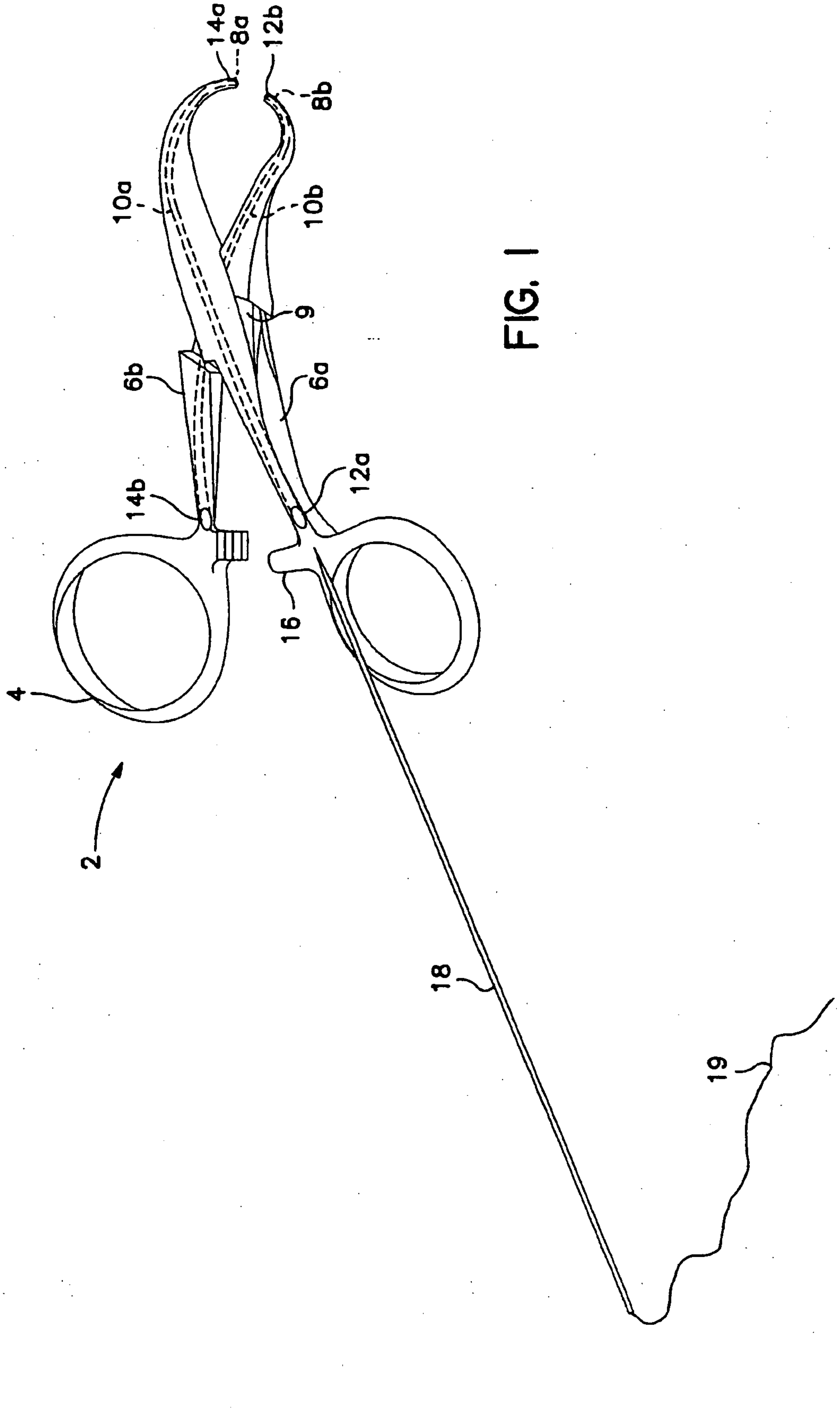

FIG. 1

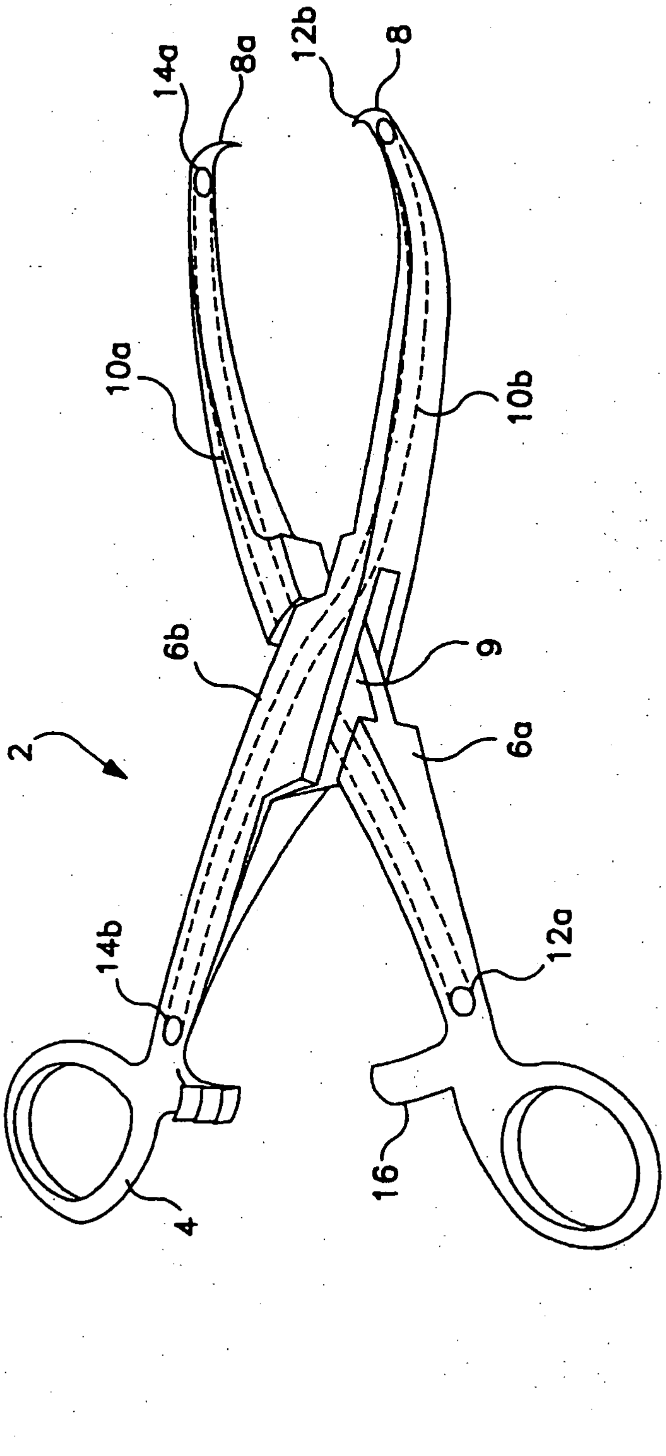

FIG. 2

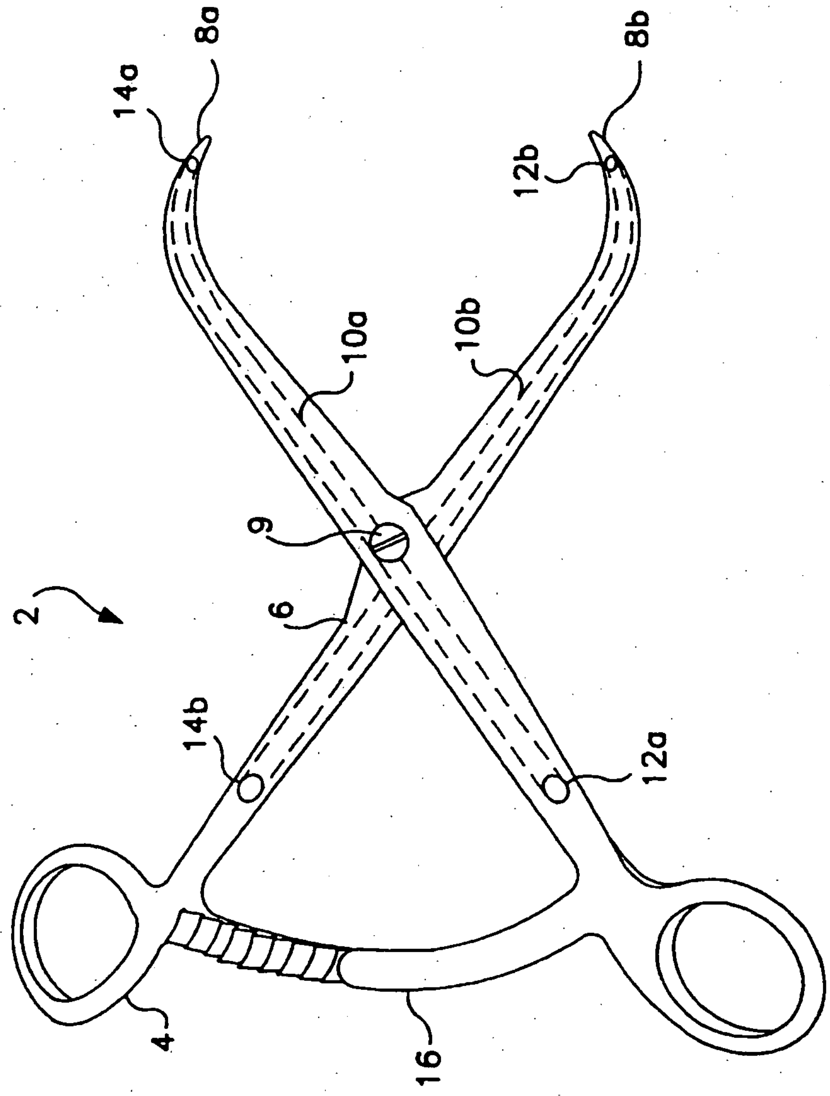

FIG. 3

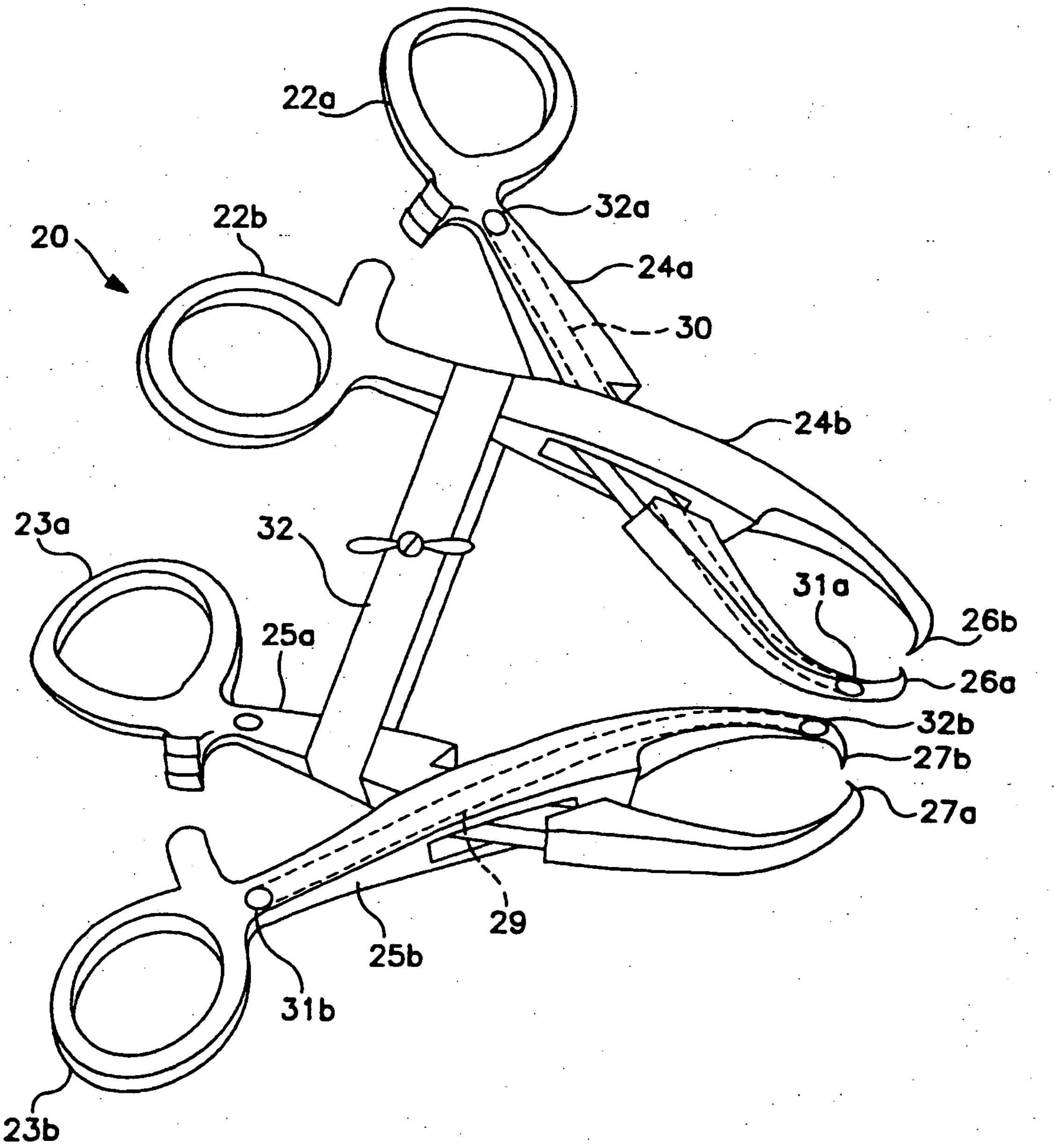

FIG. 4

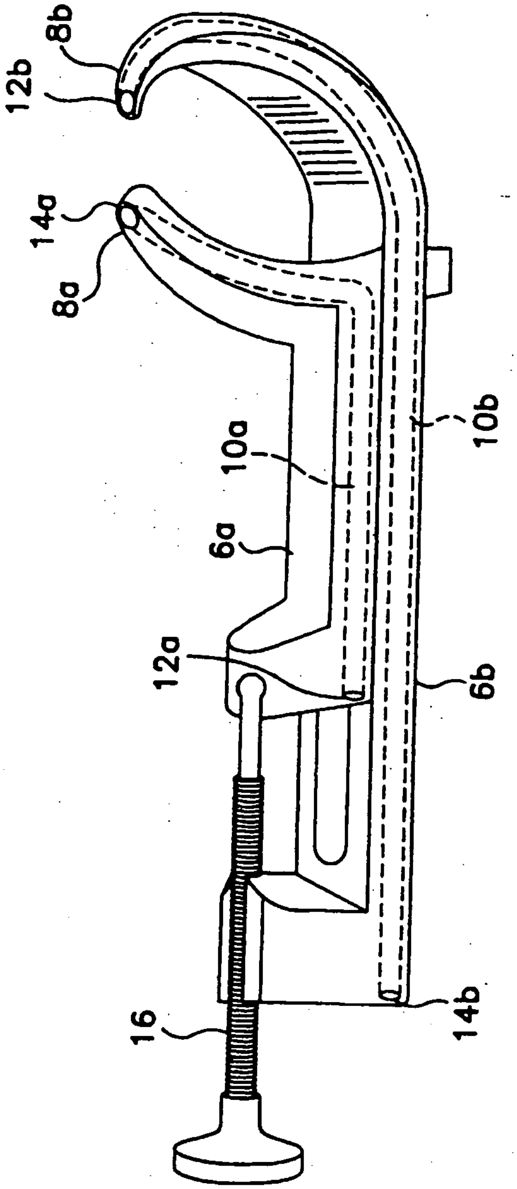

FIG. 5

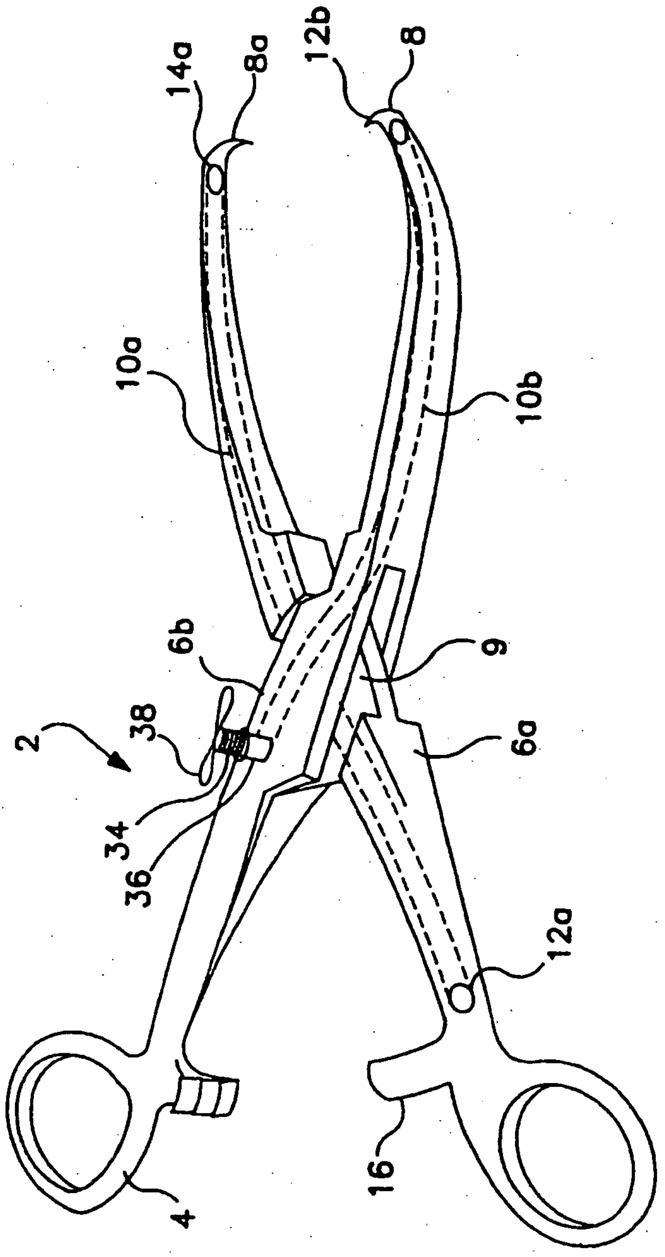

FIG. 6

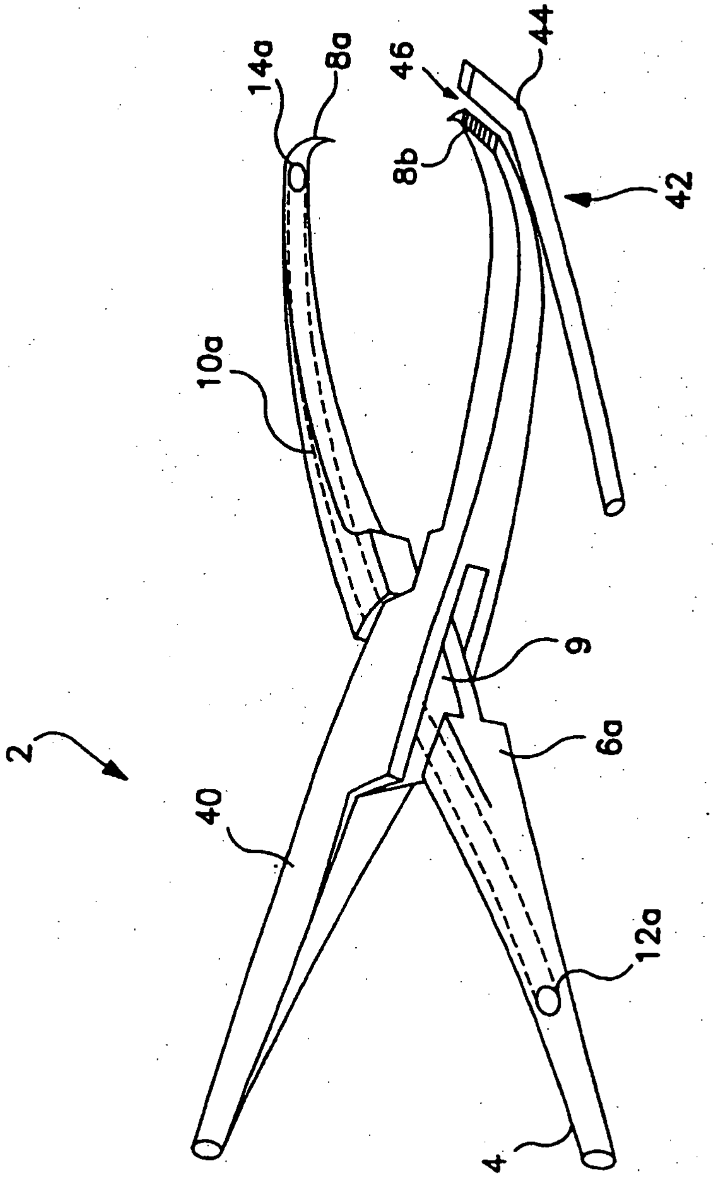

FIG. 7

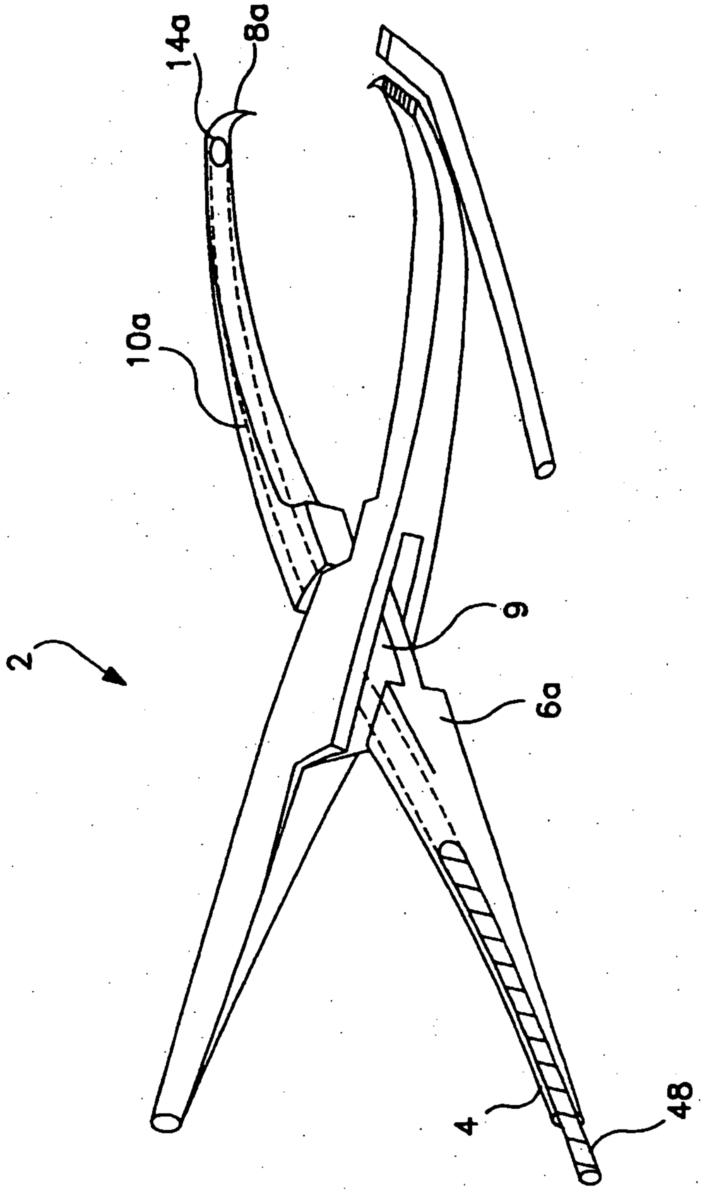

FIG. 8

European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 0681

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 3 470 875 A (JOHNSON ALFRED A) 7 October 1969 * column 6, line 57 - column 7, line 55; figures 14-16 *	1,2,4-9	A61B17/04
X	GB 2 214 814 A (BIO MEDICAL ENGINEERING LTD.) 13 September 1989 * claim 1; figures 1,2 *	1-5,7-9	
X A	US 3 946 740 A (BASSETT JOHN W) 30 March 1976 * column 3, line 33 - column 6, line 52; figures 1-10 *	1-4 5-9	
X	US 4 164 225 A (JOHNSON ALFRED A ET AL) 14 August 1979 * claim 1; figures 2,6-8 *	1,2,4-6	
X	WO 96 02197 A (SADEK LATIF ET AL) 1 February 1996 * abstract; figures 1,2 *	1-3,7-9	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A61B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	25 April 1997	Hansen, S

CATEGORY OF CITED DOCUMENTS

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